## XV. *Abſtract of a Letter from Mr.* Wm. Arderon, *F. R. S. to Mr.* Henry Baker, *F. R. S. containing ſome Obſervations made on the* Banſticle, *or* Pricklebag, *alias* Prickle-back, *and alſo on* Fiſh *in general.*

*Dear S I R,*

*Read* Feb. 5. 1746-7. MANY of my Leiſure Hours laſt Summer were employed in attending and making Obſervations on ſeveral Kinds of Fiſh; ſome whereof I with great Care have preſerved alive in glaſs Jars for many Months together.

I ſent you ſome time ago a brief Account of what I had obſerved remarkable in the Dace and Ruff, and am now going to lay before you what I have thought worth Notice in that little common Fiſh called the Prickle-Back.

About the Beginning of laſt *April* I took a Banſticle out of our River, full of Spawn, and put it into one of my glaſs Jars, at the Bottom of which I had placed a ſmall Quanitty of Sand, as I always do in every Veſſel wherein my Fiſh are kept; and about the 20th of *May* it buried its Spawn in the ſaid Sand. I was in Hopes this Spawn would have produced a young Brood, but was unluckily diſappointed; which I impute to its being frequently diſturbed by the pouring in of freſh Water.

For ſome Days after I had catched this Banſticle, it refuſed to eat any thing I could offer it, as is common with all Fiſh I have yet kept; but frequently giving

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giving it freſh Water, and coming often to it, it became ſo familiar as to eat ſmall Worms I now-and-then threw into the Jar, and from that time grew ſo tame as to take them out of my Hand; nay it became ſo bold at laſt, that when its Belly was full, or it did not like what I offer'd, it would ſet up its Prickles, and with its utmoſt Strength made a Stroke at my Fingers, if I put them into the Water to it.

This Fiſh was of ſo unſociable a Diſpoſition, that it would ſuffer no other Fiſh to live in the Jar with it, and ſo audacious, as to attack whatever I put in, though ten times its own Size.

One Day, for the ſake of Diverſion, a Friend being then with me, I put a ſmall Ruff into the Jar to it, which the Banſticle immediately aſſaulted and put to Flight, having in the Conflict torn off a good Part of its Tail; and would, I dare ſay, have killed it, had I not ſeparated them very ſoon.

Infinite Numbers of theſe Prickle-backs are to be found in almoſt all freſh Waters, where-ever it is poſſible for Fiſh to live; and whatever other Kinds the Water is repleniſhed with, this certainly is one, as far as I have yet had Opportunity to make any Enquiry.

The Endeavours they uſe, and the Ability they have, to get from Place to Place, are alſo extraordinary; for though the largeſt of them ſcarce meaſures above two Inches in Length, I have ſeen ſome of them leap out of the Water a Foot high perpendicularly, and even much further in an oblique Direction, when they wanted to get over Boards or Stones, or ſome other Obſtacle to their Paſſage.

It is ſcarce to be conceived what Damage theſe little Fiſh do, and how greatly detrimental they are to the Increaſe of all the Fiſh in general amongſt whom they inhabit. For it is with the utmoſt Induſtry, Sagacity, and Greedineſs, that they ſeek out and deſtroy the Spawn of all Sorts of Fiſh; and moreover all the young Fry, that come in their Way, are purſued by them with the utmoſt Eagerneſs, and ſwallowed down without Diſtinction, provided they are not too large.

And in Proof of what I here aſſert, I muſt aſſure you, that the Banſticle before-mention'd in my glaſs Jar, did, on the 4th of *May* laſt, devour, in five Hours Time, 74 young Dace, which were about a Quarter of an Inch long, and the Thickneſs of an Horſe-Hair. Two Days after it ſwallowed 62, and would, I am perſuaded, have eat as many every Day, could I have procured them for it.

Could Gentlemen, who take Pleaſure in Fiſh-ponds, intirely prevent theſe Deſtroyers from getting into them, I am convinced their Produce would be much greater than it commonly is: And though it may not be poſſible to keep them out intirely, it is moſt certainly adviſeable to be very diligent in the deſtroying of them: And whenever, by Netting, or other means, any of them are got out of the Water, never throw them in again, on a Suppoſition of their being harmleſs.

Nature has furniſhed this little Fiſh with a kind of Breaſt-plate or Armour, to be its Defence againſt any outward Injury: She has likewiſe beſtowed upon it ſeveral offenſive Weapons or Spines, placed upon its Sides and Back, which it immediately erects

erects upon the leaſt Appearance of Danger, or when it attacks ſome other Fiſh. The Sharpneſs of theſe Prickles guards it well enough from larger Animals, that might otherwiſe prey upon it; but neither theſe, nor all the Endeavours it can uſe, are able to free it from an Enemy that torments it even to Death; what I mean is a kind of Louſe, of an oval Figure, having eight Legs, and a very tranſparent Body, which is able either to ſwim or crawl, and ſticks on it ſo faſt, ſucking and plaguing it all the while, that it makes it almoſt mad.

One remarkable Particular in this Louſe is, that its little fibrillous Fins are always in Motion, whether the Creature be ſwimming about, or fixed upon the Fiſh.

ALL Fiſh regulate their Times of Eating and Abſtinence by the Temperature of the Air, and the Quarter from whence the Wind blows; and would thoſe Perſons who are Lovers of Angling, take the Pains to keep a few ſmall Fiſh in Glaſſes, they might at any time eaſily foretel, from their taking or refuſing Food, what Sport is to be expected, and often ſave themſelves many a weary Step taken to no purpoſe.

I have always obſerved, amongſt the Fiſh I keep in Jars, that ſuch as have lived a while together contract ſo great an Affection for each other, that if they are ſeparated they become melancholy and ſullen, and are a long time before they forget the Loſs.

About *Chriſtmas* laſt I put two Ruffs into a Jar of Water, where they lived together until *April*; when, at the Deſire of a Friend, I gave one of them away.

away. —— After this Separation the Fiſh that remained with me was ſo affected, that for three Weeks it would eat nothing I could give it; and therefore, fearing it would pine to Death, I ſent it to the Gentleman on whom I had beſtowed its Companion; and what is very extraordinary, upon being put together again, it eat immediately, recovered its former Briſkneſs, and both of them are ſtill alive.

I have made abundance of other Obſervations on Fiſh, but ſhall only add at preſent, that when they remain ſupine and unactive, they every now-and-then gape and yawn, as moſt Land Animals do, when weary of the Situation they are in. I remain,

*SIR*,

*Norwich*, July 9. 1746.

*Yours*, &c.

W. Arderon.

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## XVI. *A Suppoſition how the* white Matter *is produced, which floats about in the Air in Autumn; in a Letter from the ſame to Mr.* Baker.

*SIR*, *Norwich*, Aug. 28. 1746.

*Read* Feb. 26. 1746-7. HAVING lately a large Spider in my Hand, by chance I let it fall, and it hung by its Thread, as they very commonly do. On holding my Hand very ſtill it readily aſcended up it again; and thus, by giving it a Shake, and then holding my Hand ſtill, the Spider aſcended and deſcended